

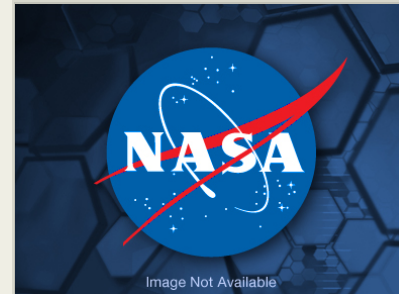
Diffuse X-rays from the Local Galaxy (DXL-3)

Completed Technology Project (2017 - 2020)



Project Introduction

DXL (Diffuse X-rays from the Local galaxy) is a sounding rocket mission for the study of the Local Hot Bubble (LHB) and Solar Wind Charge eXchange (SWCX). DXL has been successfully launched twice from White Sands Missile Range, measuring the compound cross section of SWCX with neutral He and quantifying the relative contribution of LHB and SWCX to the ROSAT R1-R7 Bands and Wisconsin C, B, and Be bands. Preparation for a third launch from Poker Flat, AK is well underway, with an expected launch date of January/February 2018. The primary focus of the launch is to measure the compound cross section with neutral H, by studying the spatial signature of the SWCX from Earth's Cusps, in order to complete the DXL characterization of LHB and SWCX at ROSAT's energy resolution. Due to damage to the payload during reentry of flight #2 in 2016, launch #3 had to be postponed by 1 year. In agreement with NASA HQs, available funds were used to refurbish the damaged payload, and the DXL mission is currently funded to support payload refurbishing, calibration, and TM handshake, but not integration, launch, and post flight calibration and analysis. In this proposal, we request support for the DXL integration, launch, and post-flight calibration and analysis. During the first two DXL campaigns, a new class of instruments using microporous optics was also integrated and successfully tested in flight using a micro-channel plate. Preparation for the DXL successor which will integrate longer focal length microporous optics with a CCD camera to study galactic diffuse emission at CCD resolution have already begun. In this proposal we also request seed funds to begin work on the DXL heir (DXG – Diffuse X-rays from the Galaxy) combining microporous optics with CCD detectors, with focus on the characterization of the optics. In addition to the technological development of the microporous optics for astrophysics applications, the scientific goal of DXG is to study the properties of the diffuse X-ray emission from LHB and SWCX to the Galactic halo.



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Organizational Responsibility

Responsible Mission Directorate:

Science Mission Directorate (SMD)

Lead Organization:

University of Miami

Responsible Program:

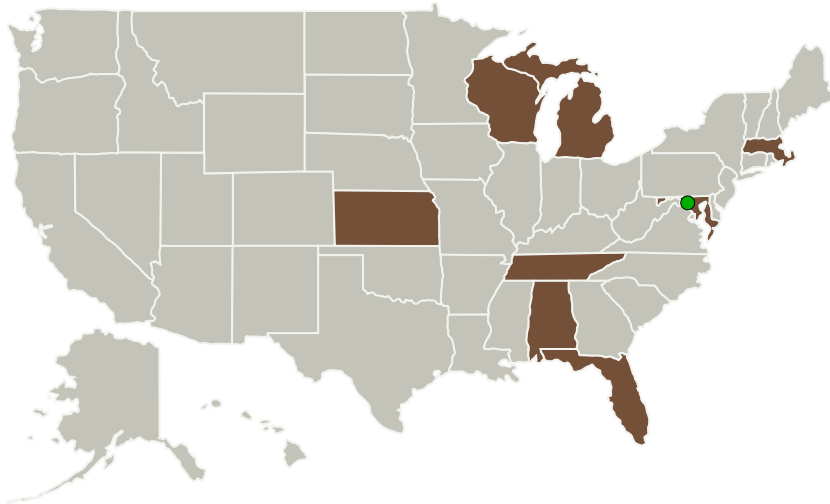
Astrophysics Research and Analysis

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Primary U.S. Work Locations and Key Partners



Project Management

Program Director:

Michael A Garcia

Program Manager:

Dominic J Benford

Principal Investigator:

Massimiliano Galeazzi

Co-Investigators:

Dimitra Koutroumpa

Dan Mccammon

Kip D Kuntz

Steven L Snowden

Frederick S Porter

Nicholas E Thomas

Susan Lepri

Thomas E Cravens

Brian Walsh

Michael Collier

Steven F Sembay

David G Sibeck

Jill F Tincher

Youaraj Uprety

Nico Cappelluti

Wenhao Liu

Technology Areas

Primary:

- TX08 Sensors and Instruments
 - └ TX08.1 Remote Sensing Instruments/Sensors
 - └ TX08.1.1 Detectors and Focal Planes

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Organizations Performing Work	Role	Type	Location
University of Miami	Lead Organization	Academia	Coral Gables, Florida
● Goddard Space Flight Center(GSFC)	Supporting Organization	NASA Center	Greenbelt, Maryland
Johns Hopkins University	Supporting Organization	Academia	Baltimore, Maryland
Middle Tennessee State University	Supporting Organization	Academia	Murfreesboro, Tennessee
University of Alabama in Huntsville(UAH)	Supporting Organization	Academia	Huntsville, Alabama
University of Kansas	Supporting Organization	Academia	Lawrence, Kansas
University of Leicester	Supporting Organization	Academia	Leicester, Outside the United States, United Kingdom
University of Michigan-Ann Arbor	Supporting Organization	Academia	Ann Arbor, Michigan
University of Wisconsin-Madison	Supporting Organization	Academia	Madison, Wisconsin

Target Destination

Outside the Solar System

Primary U.S. Work Locations

Alabama	Florida
Kansas	Maryland

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Primary U.S. Work Locations (*cont.*)

Massachusetts	Michigan
Tennessee	Wisconsin